CLAIMS

1. A method of broadband radio frequency analysis comprising the steps of:

receiving a frequency hopping radio input signal for broadband analysis, said input signal having segments at different hopping frequencies and different hopping times,

for each segment,

determining from the input signal a hopping time of the segment,

processing the segment to determine a frequency of the segment, and

processing the segment to determine signal parameters.

2. The method of Claim A1 wherein said determining step determines the start time and the stop time of the segment.

3. The method of Claim 1 wherein the input signal is an analog signal, wherein the analog signal is down converted to an intermediate frequency signal and wherein the broadband radio frequency analysis includes producing a digital signal by digitizing the intermediate frequency signal.

4. The method of Claim 1 wherein the input signal is a base band signal and wherein the broadband radio frequency analysis includes producing a digital signal by digitizing the baseband signal.

5. The method of Claim 1 wherein the input signal is an analog signal and wherein the broadband radio frequency analysis includes producing a digital signal by digitizing the analog signal using alias sampling.

6. The method of Claim 1 wherein the input signal is an analog signal and wherein the broadband radio frequency analysis includes producing a digital signal by digitizing the analog signal.

7. The method of Claim 6where the digital signal is stored in a FIFO memory.

8. The method of Claim 6 where the digital signal is stored in a memory having a capacity sufficient to store the segments for a time period used for analyzing the digitized signal.

9. The method of Claim 6 where the digital signal is processed using digital signal processing.

10. The method of Claim 9 where the signal processing includes down converting, decimating and filtering of segments to form converted segments.

11. The method of Claim 6 where the hopping time is determined using digital signal processing.

12. The method of Claim 6 where signal frequency is determined using digital signal processing.

13. The method of Claim 6 where signal parameters are calculated using digital signal processing.

14. The method of Claim 1 where the radio frequency analysis includes the step of frequency converting the input signal to a lower intermediate frequency.

15. The method of Claim 1 where the input signal is collected by a receive antenna.

16. The method of Claim 1 where the input signal is collected by a direct-wired connection.

17. The method of Claim 1 where the signal processing includes signal demodulation.

18. The method of Claim 1 where the signal processing includes measuring a signal rise time

19. The method of Claim 1 where the signal processing includes measuring a signal fall time.

20. The method of Claim 1 where the signal processing includes measuring an amplitude ripple.

21. The method of Claim 1 where the signal processing includes measuring a symbol rate.

22. The method of Claim 1 where the signal processing includes measuring a signal modulation depth.

23. The method of Claim 1 where the signal processing includes determining transmitted symbols.

24. The method of Claim 1 where the signal processing includes measuring symbol jitter.

25. The method of Claim 1 where the signal processing includes measuring segment duration.

26. The method of Claim 1 where the signal processing includes measuring an interval between a start time of a first segment and a start time of a successive segment.

27. The method of Claim 1 where the signal processing includes identifying and measuring amplitude and frequency for spurs, harmonics and stray signals.

28. The method of Claim 1 where the signal processing includes comparing measured signal parameters with reference signal parameters to determine compliance with a specification.

29. The method of Claim 1 where the signal processing includes calculating a carrier frequency for each segment.

30. The method of Claim 1 where the input signal is an analog signal, where the analog signal is digitized to form a digital signal, where the signal processing includes calculating a carrier frequency for each segment of the digital signal using spectral analysis.

31. The method of Claim 30 where the spectral analysis includes a digital Fourier transform.

32. The method of Claim 30 where the carrier frequency is calculated from a power spectrum using a center of mass algorithm about a largest component in the power spectrum.

33. The method of Claim 32 where a mean value of the largest component in the power spectrum is used to refine the carrier frequency calculation.

34. The method of Claim 1 where the signal processing includes calculating signal bandwidth.

35. The method of Claim 34 where bandwidth is calculated using spectral analysis.

36. The method of Claim 1 where the input signal is an analog signal, where the analog signal is digitized to form a digital signal, where the signal processing includes calculating signal bandwidth for each segment of the digital signal using spectral analysis and where the spectral analysis uses a digital Fourier transform.

37. The method of Claim 36 where the bandwidth is based on identifying a bandwidth value where a spectrum drops to a threshold level below a peak.

38. The method of Claim 37 where the bandwidth is based on the bandwidth containing a given percentage of the signal energy.

39. The method of Claim 1 where the signal processing includes measuring a symbol rate and where the symbol rate is calculated one for each signal segment independent of the other segments.

40. The method of Claim 1 where the signal processing includes measuring a symbol rate and where the symbol rate is calculated by spectral analysis.

41. The method of Claim 1 where the signal processing includes signal demodulation to form a demodulated signal and where the signal processing includes measuring a symbol rate where the symbol rate is calculated by analysis of zero crossing times in the demodulated signal.

42. The method of Claim 41 where time differences between zero crossings is calculated from zero crossing times.

43. The method of Claim 42 where a TOT histogram is compiled of the time differences as deltaTOTs.

44. The method of Claim 43 where a symbol period estimate of a symbol period is formed from a center of mass of a first major peak in the TOT histogram.

45. The method of Claim 44 where the symbol period is calculated by,

computing the modulo of the delta TOTs and the symbol period estimate,

unwrapping the modulo results about the symbol period estimate,

fitting a straight line to the unwrapped data,

using a slope of the straight line to refine the symbol period estimate thereby producing a final value for the symbol period.

46. The method of Claim 45 where the straight line fit uses a least squares fit.

47. A method of broadband radio frequency analysis comprising the steps of:

receiving an input signal for broadband analysis where said input signal has segments wherein said segments have different segment frequencies, wherein each segment has a segment frequency , wherein each segment has a segment bandwidth, and wherein the segment frequency for each one of the segments differs from the segment frequencies of other ones of the segments by amounts that are greater than the bandwidth of one or more of the segments,

determining from the input signal start times and stop times of said segments, and for each segment,

processing the segment to determine said segment frequency and said segment bandwidth, and

processing the segment to determine signal parameters.

48. A method of broadband radio frequency analysis comprising the steps of:

receiving an input signal for broadband analysis where said input signal has segments wherein said segments have different segment frequencies, wherein each segment has a segment frequency , wherein each segment has a segment bandwidth, and wherein the segment frequency for each one of the segments differs from the segment frequencies of other ones of the segments by amounts that are greater than the bandwidth of one or more of the segments,

determining from the input signal start times and stop times of said segments, and for each segment,

processing the segment to determine segment amplitude between the start time and a stop time,

processing the segment to determine said segment frequency and said segment bandwidth, and

processing the segment to determine signal parameters.